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Understanding Changes in China's Food Consumption

A proposal submitted to the Central Fund of USDA's Emerging Markets Program
by
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Overview:
This proposal targets China's rapidly growing market for high-quality and value-added food products. Increasingly prosperous and busy consumers in China are consuming more fruit, vegetable and livestock products and fewer food grains, consuming more food away from home and more processed food products, and increasingly choosing foods on the basis of quality, safety, and other factors in addition to price. The emerging market for these products is large and growing rapidly, with 600 million urban consumers who spend additional income on quality factors and dining out. With projected middle class growth and demographic change in China over the next 20 years, these trends hold significant opportunities for U.S. food exporters.

Despite the importance, there is an acute lack of information on consumption trends in China and the demographic and economic drivers of these trends, leaving U.S. agricultural interests with few means to identify market opportunities. The proposal herein is for second year funds in a three-year project to address this problem.[1] EMP support for this proposal will enable USDA to participate in an ambitious program of market research using unique primary data collected by the Chinese Academy of Sciences. The research program will allow USDA to assess the potential for exporting a variety of value-added products, determine specific information on consumer habits and preferences that will help USDA promote U.S. products in China, and develop information that will enhance USDA's understanding of overall consumption of agricultural commodities in China. The research program will also develop capacity and working relationships between USDA agencies and the ministries and research institutes in China concerned with consumption issues through collaborative research and exchanges and will help USDA fulfill objective 3.7 in the China Country Strategy Statement (GAIN Report – CH8015).

[1] FY2009 funds will be used to further develop a FY2008 EMP supported project to obtain and analyze household consumption data from Beijing. Preliminary findings from FY2008 work are presented in this proposal.

Background and Justification:
Consumption patterns in China are in a state of transition, particularly in rapidly changing urban areas. Income growth is allowing households to substitute vegetables, fruit, and livestock products for staple grains. More recently, consumers in China have begun selecting goods based on quality over price and quantity, and food consumed away from home is rising as well.

What is known about these changes comes predominantly from data collected by China's National Bureau of Statistics (NBS) in their Urban Household Income and Consumption Survey (UHICS).[2] Using a sample of this data, analysis conducted by USDA's Economic Research Service shows that wealthier households consume less grain and more non-grain food products, and also that the price per unit of food rises as income increases, presumably because wealthier households are choosing higher quality foods. NBS survey data also includes the amount households spend on food away from home and this also rises with income.

Beyond understanding these basic trends, the usefulness of NBS data is limited and it is costly to obtain. Because of its reliance on recall of consumption over the last month, many believe the estimates of consumption at home and away from home in the data are inaccurate. Moreover, the NBS data provide almost no information on the following important areas:

Food away from home – NBS survey data includes a household's estimate of how much they spent of food consumed away from home, but the composition of these purchases is entirely unknown. Because urban employers and schools often subsidize meals in China, significant amounts of food are likely consumed away from home and are not paid for by the household so are not included in NBS surveys.

Individual demographic data – NBS household surveys pool consumption information at the household level making it difficult to infer demand and consumption patterns of individuals, and how they relate to individual traits such as age, education, individual income, job type and work schedule (i.e. the number of hours worked per week).

Specific attributes – There is no information on preferences for certain attributes important to U.S. exporters including quality, safety, convenience, nutritional, branding and certification (both government and private). Such information would be very useful for developing programs to promote U.S. products.

Ultimately the net position of China in world markets, and U.S. producers' opportunities, will likely depend on these consumption trends as much, if not more, than trends in production. U.S. producers have a long history of producing food products with high quality standards and developing products that offer convenience. U.S. food products also benefit from a system of traceability and safety standards that can give them an advantage when marketed abroad to consumer that seek safety assurances. U.S. exporters interested in China's market will benefit from research that identifies the drivers of these trends, and forecasts how these markets will grow in the future. Reducing uncertainty in these market trends will serve to reduce the risk, and associated costs, of entering China's expanding market for high-value food products.

[2] Nearly all studies on food consumption in China, including private consulting companies, use this data. There are a very limited number of studies published in China that have done small consumer or restaurant surveys.

Project Objectives:
To obtain a more in depth understanding of the rapidly emerging consumption patterns in China, the economic and demographic drivers of these changes, and develop relationships that will allow USDA to continue to assess these changes, ERS and FAS are coordinating a project that will fulfill a number of objectives for market assessment and development, research and technical assistance.

Market Assessment and Development Objectives: The project will provide information that will allow ERS and FAS to

- Produce a series of GAIN reports with descriptive statistics to fill in our understanding of the trends outlined in the proposal and enhance U.S. exporter's capacity to identify where they are competitive and how they can differentiate their products to be successful.

- Evaluate the implications of the findings from this project for overall disappearance of important commodities and make subsequent changes in USDA PS&D and Baseline estimates.

Research Objective: ERS and FAS will work with research partners in China and the United States to

- Develop a database for addressing consumption trends in a comprehensive way, including a mechanism to convert Chinese and other dishes into commodity equivalents that can be used for future research.

- Publish ERS research reports that estimate the relationships between consumption pattern, income, and demographic features in a multivariable framework, and forecast future changes as income, urbanization and demographic variables change.

- Present the findings of the research outlined above at USDA sponsored events, cooperator meetings and academic conferences.

Technical Assistance Objective: The project will introduce USDA frameworks for understanding consumption patterns and the role of safety policies, quality (such as integrity assurance) policies, certification, branding and increasing food consumed away from home, and their implications for food consumption and public health. The project will develop relationships between USDA (particularly FAS, ERS and ARS), and policy and research oriented ministries and institutes in China such as:

- National Bureau of Statistics
- Chinese Academy of Sciences
- Chinese Academy of Agricultural Sciences
- Chinese Academy of Social Sciences
- Ministry of Agriculture
- Ministry of Health
- Universities (i.e. Renmin University, Shanghai Jiaotong, Southwest China School of Economics and Finance)

ERS has strong capacity to successfully complete this plan. ERS has a world-class program of research on both China issues and consumption issues. The ERS China program publishes regularly on a variety of issues affecting China's agricultural production, consumption, marketing, and trade. The ERS China team has also worked with China's National Bureau of Statistics on a number of consumption oriented studies using the rural and urban household survey data, as well as with the Chinese Academy of Sciences and U.S. Universities on a number of research projects. Food consumption specialists at ERS have produced reports on the consumption of food away from home, food safety and quality issues, and have linked these trends to economic, social and demographic trends, and other relevant issues in the United States, and they will bring their experience and expertise to the proposed project.

ERS is working closely with FAS in the development, management, and dissemination of results from this project. The project will provide critical information to support U.S. agricultural export promotion and ties into current FAS projects underway in China. Market information produced by this project will be key for cooperators and U.S. producers seeking to enter or expand into China's food market. The relationships developed through this project will also provide FAS with access to leading scholars and policymakers on consumption issues in China. FAS-China is also working on an EMP funded project to support stronger intellectual property right enforcement in China, and the findings from this research project regarding the preferences for, and returns to, branding and certification will complement these efforts. Another EMP funded project in China involves cold-chain development, and information from this project will be useful to producers of the high-valued products that rely on cold-chains.[3]

FY2008 Accomplishments and Results:
FY2008 EMP funds supported the preliminary analysis of data collected from 320 households in Beijing in July, 2007. The 320 households were a stratified sample selected from the 1135 households included in NBS' survey from 4 districts in Beijing. Enumerators from the Chinese Academy of Sciences (CAS) and Washington State University (WSU) accompanied the NBS enumerators in charge of each household to collect additional economic and demographic data, data on preferences and how food safety is determine for a variety of food products, and to drop off a food diary to record all food consumed at home and away from home by all members of the household for each meal over a one-week period.[4] For food at home, households also indicated where they purchased each item and whether it was fresh, semi-processed or ready-to-eat. Enumerators called the household twice during the week to answer any questions they had and returned to the household at the end of the week to pick-up the food diary, review the entries, and make any clarifications necessary. The result is a comprehensive snapshot of food consumption over a one-week period for urban households in Beijing.

Using support from the FY2008 EMP grant, researchers at CAS and WSU converted these records into commodity equivalents, including the over 1,600 different types of dishes the

[3] The US Cotton Council International (CCI), working with other cooperators in the textile industry, has also proposed a project to EMP that is very similar to this one but focuses on textile consumption rather than food products. ERS and FAS plan to work with CCI on that project if their proposal is successful.
[4] The data collection effort was supported by funds from Washington State University and the Chinese Academy of Sciences.

households recorded consuming away from home. This work is still underway, making further refinements in the transformation into commodity equivalents, analyzing relationships with economic and demographic features of the household. This work will be continued with the FY2009 EMP support requested in this proposal. Preliminary results from the Beijing households include:

Food Away from Home in Significant

- Expenditures on food away from home in our data are 163 RMB/month/person, nearly twice the level estimated by the NBS for the subset of households we surveyed (90 RMB/month/person). After including food consumed away from home but not paid for by the household, we estimate total food away from home consumption to be 225 RMB/month/person, 2-1/2 times the NBS figure.

- According to our preliminary estimates, over 40 percent of household meat consumption and nearly 30 percent of household vegetable consumption occurs away from home, and these proportions rise as income rises.

- Around 40 percent of food away from home is consumed in cafeterias, with another 20 percent in restaurants and about 10 percent in fast food venues and another 10 percent at small food stands. Much of the cafeteria consumption is subsidized by employers or schools.

Purchasing Behavior

- Roughly 80 percent of meat and dairy products consumed at home are purchased at supermarkets, with about 60-percent of grain products and drinks purchased at supermarkets. However, only around 10 percent of vegetables consumed at home are purchased at supermarkets, with around 80 percent still purchased at wet markets, and fruit purchases are similar.

- Safety is the most important factor in determining purchases (more than price), but safety is determined differently for different products. For meat – safety is determined primarily by vendor reputation. For fruit and vegetables – safety is determined primarily by appearance. For processed drinks and dairy products – safety is determined primarily by brand. Government or independent certification was not a common means to determine safety, except with diary products (probably due to HACCP labels).

- Semi-processed or ready-to-eat foods comprise about 30 percent of at home purchases, but this figure varies widely with the type of food product.

- All three of these, the proportion of food purchased at supermarkets, the importance of safety, and the proportion of semi-processed or ready-to-eat foods, increase as incomes rise.

These results are new information coming from unique data set, however they are representative of only Beijing, and cities in northern China more generally. Broadening the research efforts to

include other parts of China will serve to better understand consumer behavior in other rapidly growing areas.

FY2009 Workplan:
In FY2009, ERS will continue to work with FAS and partners at U.S. Universities and in China to further analyze the results from a 2007 survey in Beijing and expand the geographic and informational scope of the research and exchanges. Activities in FY2009 include the continued development of coding to translate (predominantly) Chinese dishes into commodity equivalents, another round of data collection from an expanded list of cities in Spring, 2009, cleaning and preparation of the data collected in 2009, travel for food consumption specialists and principals in the project to work on joint reports and technical assistance (see Table 1. Schedule of Activities, last page).[5]. We will also continue to analyze the 2007 Beijing data to understand how food consumption trends vary with income and demographic characteristics of households. With forecasts of China's continued income growth and ageing population, we can use these relationships to begin forecasting future changes in urban food consumption.

In Spring, 2009, the Chinese Academy of Sciences and Washington State University plan another round of survey work to cover not only Beijing but also Shanghai and Chengdu (in conjunction with Shanghai Jiaotong University and Southwest China University of Economics and Finance in Chengdu). Another round of data from Beijing will allow for an initial understanding of consumption changes due to seasonal and price variation.[6] Data from Shanghai and Chengdu will allow the research team to assess differences between important regions in China. Shanghai is China's largest and among the most modern cities with rapidly rising middle class, a modernizing and internationalizing culture, and growing ranks of Western restaurants. Chengdu is the urban heart of Southwestern China, the most rapidly growing part of the country, and has a long tradition of eating out and experimenting with different foods. Data from all three cities will be more representative of the nation as a whole than just from Beijing.[7] The FY2009 survey will also be expanded to include more detailed information on consumption of cooking oil, sugar, and starch, more carefully enumerate preferences and purchasing behavior, and assess attitudes toward biotechnology, in addition to the already detailed information of food consumption included in the 2007 Beijing survey.[8]

To improve the project's capacity to address these and other issues, ERS will coordinate a team of specialists on food consumption issues from ERS, WSU and University of Florida to travel to China for two weeks in the first or second quarter of FY2009 (Table 1). The team will meet with consumption specialists at universities, research institutes and government agencies in China to

[5] ERS is working with collaborators at the Center for Chinese Agricultural Policy (CCAP) at the Chinese Academy of Sciences (CAS), the International Marketing Program for Agricultural Commodities and Trade Center (IMPACT Center) at Washington State University (WSU), and the International Agricultural Trade and Policy Center (IATPC) at University of Florida. Both of the US research centers involved in the project have close ties to agricultural producers in their respective states and conduct research in support of export opportunities for U.S. producers.
[6] A second enumeration of Beijing households will also provide a panel data set that allows researchers to control for household "fixed effects", a robust statistical technique for estimating relationships between household consumption choices and economic or demographic features that controls for unobserved household variables.
[7] All three cities represent large regions of dynamic income growth and urbanization but with different culinary preferences and consumer behavior. FAS has Agricultural Trade Offices in all three of these cities.
[8] These suggestions come out of meeting with FAS staff on the preliminary results from the 2007 survey.

share research results on consumption issues in the United States, and also work with CAS on the Beijing data and determine responsibilities for future analysis. This trip will serve to improve China's capacity for analysis of consumption issues, improve USDA's relationships with specialists in consumption issues in China, and assure that the data and analysis from the proposed project is state-of-the-art. The involvement of food consumption specialists from ERS and U.S. universities will also improve the team's overall ability to analyze these issues using the data collected in 2009.

EMP support will allow for USDA involvement in this project. FY2009 EMP support will allow USDA to use the expanded data, support the analysis of the data, and bring in prominent US specialist on food consumption to work with the data. With EMP funds, ERS and FAS can support analysis of the data to understand issues that are important to US producers, exporters and USDA staff charged with promoting US exports. Findings from this project will be reported in USDA publications (ERS research reports and FAS GAIN reports), and presented at USDA sponsored events. The project will enhance the capacity of the Chinese research community to understand important consumption trends, and develop relationships between USDA and these researchers for future work on consumption issues.

Budget:
The FY2009 budget covers the costs of travel, support for data analysis and salary support for ERS staff while on technical assistance components of the project (Table 2. Budget, last page). FY2009 funds requested are the largest of the 3-year project and will allow USDA to contract funds with research partners that can be used to conduct analysis beyond FY2009. This amount will assure sufficient funds to complete the planned activities and fulfill the market assessment and research objectives.

Travel. EMP funds will cover the costs of collaborators' travel on the project. This will include one team of ERS and University specialists traveling to China to work with collaborators at the Chinese Academy of Sciences, meet with other researchers in China working on consumption issues, and visit surveyed areas. In addition, the Project Manager will travel to China to initiate the FY2009 plans and seek additional funds from agencies in China, then one more time on the project in FY2009 the project with one or two university partners or ERS specialists to work closely with collaborators in China on data analysis, drafting reports and fieldtrips to individual households and survey areas. The project will also fund one trip of two research staff from China to work in the United States on the project, both at the IMPACT Center and at ERS.

Data Acquisition and Analysis. The largest portion of FY2009 funds will be used to support research and analysis activities and defray the costs of (China) domestic travel for students, enumerators and U.S. research staff that will accompany NBS staff to the households participating in the project. The funding will cover a portion of the costs of data acquisition, development and analysis at Washington State University and Chinese Academy of Sciences, the costs of entering and cleaning the data, the costs of preparing the data for analysis and the costs of the data analysis itself. The EMP funded contribution to these costs comprises only about 20-30 percent of the total costs of data collection and analysis. For the project to cover the 3 cities (Beijing, Shanghai and Chengdu), we have projected data collection costs of $250,000-$300,000, with research salaries for data analysis coming to another $200,000-$250,000. The Chinese

Academy of Sciences and the IMPACT center at WSU have contributed to the project in the past and will contribute a portion of the costs of future research. [9] We are also seeking additional support from government ministries and funding agencies in China and international organizations.

ERS Salaries. Project funds will also be used to cover ERS staff salaries while traveling to China and on technical assistance components of the project. Salary costs are estimated using roughly $475.36/day (GS-15-1) and 70 days (2 ERS Staff on a 10 workday trip for 20 days, two additional trips by project manager for 10 workdays each is another 20 days, and 20 days ERS staff coordinating trip and spent working with researchers from China while visiting ERS). Salaries for ERS staff working on this project conducting analysis and publishing reports at ERS will be covered by ERS.

[9] FY2009 EMP funds will also support the activities related to this project for a post-doctoral researcher at WSU, Dr. Junfei Bai. Washington State University's IMPACT Center supported Dr. Bai's salary on the project for two years (December, 2006-Decmeber, 2008). While employed by the IMPACT center, Dr. Bai drafted the initial survey instrument, developed the survey and sampling approach, solicited support from China's NBS, trained enumerators and supervised the implementation of the Beijing survey. Dr. Bai also coordinated and personally conducted much of the analytical work on translating dishes into commodity equivalents. In FY2009, Dr. Bai will be the primary researcher conducting analysis on this project, and will help coordinate the analytical work at the Chinese Academy of Sciences. The Chinese Academy of Sciences has agreed to support Dr. Bai's work on this project after FY2009. The IMPACT Center, the Chinese Academy of Sciences and Shanghai Jiaotong University will also fund the direct costs of data collection.

Table 1. Schedule of Activities*

Year	FY08		FY2009				FY2010			
Quarter	3	4	1	2	3	4	1	2	3	4
Research – Activities										
Review current literature	X	X	X							
Plan data acquisition		X	X	X						
Data acquisition				X	X	X	X			
Data preparation				X	X	X	X	X		
Descriptive tables					X	X	X	X	X	X
Econometric analysis						X	X	X	X	X
Drafting reports/presentations			X	X	X	X	X	X	X	X
Research – Travel										
Project Manager	X		X		X			X		X
Other Research			X					X		X
Technical Assistance										
US Team to China				X					X	
China visitors to the US						X				X

* This schedule is identical to the one submitted in the FY2008 proposal except truncated in '08 to reflect that funds did not arrive until the second quarter of that year. Some activities have been moved up, such as report writing, which will begin with a GAIN report in September, 2008, based on the 2007 data.

Table 2. FY2009 Budget

Travel		
US Teams to China	1 team of 5 for two weeks @ $35,000	$35,000
Project Manager Travel	2 additional trips @ $7,000 each	$14,000
Cooperator Travel	2 trips for two weeks @ $7,000 each	$14,000
China Researchers in US	2 trips for three weeks @ $9,000/each	$18,000
Data Acquisition and Analysis		
Domestic	IMPACT Center, Univ. of Florida	$80,000
China	CCAP, and other research institutes	$80,000
ERS Salary Support	China and food consumption specialists	$33,276
Project Total for FY2009		$274,276